

01
--25. (Amended) The adsorption powder according to Claim 1, wherein the organic compounds are selected from furans and dioxins.--

REMARKS

Claims 1 through 3, and 5 through 25 are currently in the application. Claim 4 has been canceled. Claims 1 through 3, and 5 through 25 have been non-finally rejected. The rejection of Claims 1 through 3, and 5 through 25 is respectfully traversed.

Applicants' election of Group I, Claims 1 through 3, and 5 through 25 in the paper mailed February 11, 2003 is hereby confirmed. Group II, Claim 4, has been canceled without prejudice to file a divisional application directed to the subject matter thereof.

Claims 24 and 25 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner stated that "[c]laims 24-25 provide for the use of the adsorption powder, but, since the claims do not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass."

Responsive to the rejection, Claims 24 and 25 have been amended to further limit and particularly point out the various metals and organic compounds recited in Claim 1. No new matter has been added to the claims by these amendments. Antecedent basis for the amendments can be found on page 4, lines 15 through 17 of the specification and Claims 24 and 25, themselves. Claims 24 and 25, as amended, provide Markush groupings of the metals and organic compounds suitable for processing by the adsorbent composition of the invention. Claims 24 and 25, as amended, are believed to overcome the indefiniteness rejection.

The Examiner rejected Claims 24 and 25 under 35 U.S.C. § 101 “because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process”

Responsive to the rejection of Claims 24 and 25 under 35 U.S.C. § 101, the claims have been amended to recite Markush groupings for the metals and organic compounds of Claim 1 from which they ultimately depend and thereby further limit and more particularly point out the subject matter of the invention. These amendments are believed to obviate the § 101 rejection.

Claims 1 through 3, and 5 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 5,496,785 to Abler. In making the rejection, the Examiner stated “[r]egarding claim 1, Abler ‘785 discloses a dual impregnated activated carbon suitable for filtering contaminants (abstract) comprising activated carbon and group 6-12 salts including copper chloride (see column 3, line 56). Regarding claim 2, Abler ‘785 discloses wood, coal, coconut, and organic polymers (see column 2, lines 19-21). Regarding claim 3, Abler ‘785 discloses 1.5-40% metals (see column 3, lines 35-36 and 41-42). Regarding claim 5, Abler ‘785 discloses potassium permanganate also may be included (see column 1, lines 30-32).

Responsive to the rejection of Claims 1 through 3, and 5 under 35 U.S.C. § 102(b), Abler ‘785 fails to disclose or remotely suggest ‘an adsorption powder comprising cupric chloride for removing metals’ as recited in the instant Claim 1 from which Claims 2, 3 and 5 depend. The present invention is directed to a novel adsorption composition suitable for removing mercury from gaseous streams. The Abler reference fails to anticipate an adsorption powder containing cupric chloride for removing mercury from gaseous streams. Abler discloses removal of gaseous contaminants such as HCN, hydrogen halides, hydrogen sulfide, etc. from air (column 4, lines 29 through 37). The reference further requires an activated carbon impregnated with at least 1st and 2nd metal salts. The second metal salt is defined as a Group 6 to 12 metal salt, wherein copper

chloride is taught at column 2, line 56. To make out a *prima facie* case of anticipation, the cited reference must contain each and every element of the claims under examination (see *Radio Steel Mfg. Co v. MTD Products, Inc.*, 221 USPQ 657, 661 (Fed. Cir. 1984)). Abler fails to anticipate the use of the instant invention, since the reference suggest using the adsorbent for "removal of gaseous contaminants such as HCN, hydrogen halides, and hydrogen sulfide. Abler requires the presence of a 1st metal salt, wherein the metal in a Group 1 metal carbonate; the 1st metal salt is not required by the instantly claimed invention. Abler fails to meet the standards of an anticipatory reference.

Claims 6 through 8, and 24 through 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Abler '785 in view of U.S. Pat. No. 6,352,956 to Kienow *et al.* In making the rejection, the Examiner stated that "Abler discloses carbon/metal mixtures of 1.5-40% metals (see column 3, lines 35-36 and 41-42). Abler fails to disclose about 10-70% calcium hydroxide. It is considered that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the 0-70% calcium hydroxide in the activated carbon contaminant adsorbent of Abler because Kienow discloses his calcium hydroxide in an activated coke (abstract) contaminant cleaning adsorbent (see column 1, lines 15-35) to be useful in essentially all exhaust gas cleaning systems as reactive calcium compounds (see column 3, lines 61-67 and column 4, lines 1-9). Regarding claims 24-25, Kienow '956 discloses up to 40 percent activated cokes (abstract) and 0-70% calcium hydroxide (see Table)."

Responsive to the rejection of Claims 1 through 3, and 5 under § 103(a), Abler fails to suggest the use of cupric chloride impregnated onto a carbon-based material for the removal of mercury from a gaseous stream (as discussed herein above in the § 102(b) rejection). Kienow fails to suggest the use of cupric chloride impregnated onto a carbon-based material for the removal of mercury from gaseous streams. Kienow suggest the use of a carbon compound for precipitation of acid pollutant gases, such as HCl, SO₂, HF, etc. (column 1, lines 35 through 39). There is no suggestion in either reference that would motivate a person of ordinary skill in the art to combine the references as the Examiner

has done. Nevertheless, the combination still does not suggest 'cupric chloride impregnated on a carbon substrate for the removal of mercury from gaseous streams.' A person of ordinary skill in the art would have not been motivated, at the time the instant invention was made, to combine the referenced to make a *prima facie* of obviousness as the Examiner has done. Even with the combination of the cited references, there is still no teaching of the instantly claimed composition or its intended use.

The Examiner argued that "Kienow '956 discloses removal of dioxins, furans, and heavy metals (see column 1, line 25-28). But where is the motivation for extracting the teachings of Kienow, *i.e.* the removal of dioxins, furans and heavy metals, and combining the same with Abler? There has to be some recital in Abler that the composition thereof is useful for removal of dioxins, furans and heavy metals to combine the references based upon the logic of motivation, otherwise there is no motivation for the combination.

Claims 9 through 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Abler '785 in combination with Kienow '956, and in view of U.S. Patent No. 5,352,647 to Suchenwirth. In making the rejection, the Examiner stated "[c]laims 9-14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Abler '785 as applied to claim 5 above, and further in view of Kienow '956 and Suchenwirth US 5,352,647 . . . Suchenwirth '647 discloses 0.5-5% sulfur (see column 5, lines 5-15). It is considered that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the 0.5-5% sulfur of Suchenwirth in the activated carbon exhaust gas contaminant adsorbent of Abler because Suchenwirth discloses his sulfur in a composition for separating noxious substances from exhaust gases (title, abstract) to obtain the essential advantage that they can be dissolved in water during the slaking process or applied in finely dispersed form on the calcium hydroxide subsequent to the slaking process, to facilitate the application of surface-active substances, and to considerably promote reactions with heavy metals and VOCs with the fine distribution (see column 2, lines 28-36)."

Suchenwirth teaches 'a composition for separating out noxious substances from gases and exhaust gases.' The reference suggests mercury as a volatile heavy metal for removal from noxious substances, and the adsorption composition is a powder containing calcium hydroxide, and one water-soluble salt of a sulfur containing substance selected from polysulfide, polythionates and thiosulfates. While Suchenwirth suggests the removal of volatile heavy metals, Abler suggest filtering gaseous contaminants such as HCN, hydrogen halide gases of HF, HCl, etc. with copper salts on a carbon substrate, and Kienow suggests grain size distribution of activated coke for cleaning exhaust gases. One of ordinary skill in the art would have not been motivated by the individual teachings in each reference to combine them as the Examiner has done to support a *prime facie* case of obviousness. None of the 3 references suggest the same use of the carbon-containing composition. Only the last reference, Suchenwirth, even suggests the removal of mercury; the remaining 2 prior art references fail to suggest the removal of mercury from a gaseous stream. Abler and Kienow fail to teach or suggest the instantly claimed composition for the use stated therein. Therefore, Suchenwirth can not repair the motivation that is not suggested for combining the Abler and Kienow references. The only motivation for combining all 3 references is, perhaps, the use of a carbon-based composition. Otherwise, the function of the compositions are quite different, and one of ordinary skill in the art would not be motivated to combine the references as the Examiner has done to make out the § 102(b) and § 103(a) rejections.

The Examiner stated that "Claims 15-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims." We agree with the Examiner's assessment of Claims 15 through 23. However, we believe that Claims 1 through 3, 5 through 14, 24, and 25, all the claims in the case, are also allowable in view of the prior art relied upon in making the rejections.

The cited prior art references placed on the record but not relied upon in the rejections, U.S. Pat. No. 4,305,827 to Sasaki, and U.S. Pat. No. 5,336,835 to McNamara,

fail to teach or suggest the instantly claimed invention. Sasaki teaches mercury selective adsorbents prepared by treating activated carbon with a primary or secondary amines and carbon sulfide. McNamara suggests activated carbon impregnated with a composition containing metal halides or other reducing halides for removing mercury from liquid hydrocarbons. Neither reference remotely teaches or suggests a carbon-based mercury adsorbent containing cupric chloride.

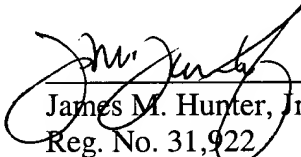
An Appendix showing an amended version of the claims, wherein "strikethroughs" represent deletions and "underlines" represent additions, is attached herewith.

CONCLUSION

Entry of the amendments to the claims, reconsideration of Claims 1 through 3, and 5 through 25, and allowance thereof is respectfully requested. No additional fees are believed to be due for this election. However if any additional fees are due, the Examiner is authorized to deduct the same from Deposit Account No. 13-2755.

Should the Examiner have any questions or wish to discuss this case, he is requested to contact Applicants' undersigned representative at his earliest convenience.

Respectfully submitted,



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Attachment: Appendix

APPENDIX

VERSION OF AMENDED CLAIMS SHOWING CHANGES THERETO

“Underlined” portions represent additions and “strikethrough” portions represent deletions.

In the Claims:

Claims 24 and 25 have been amended as follows:

--24. (Amended) The adsorption powder according to Claim 1, wherein the ~~powder is useful for removing~~ metals are selected from the ~~group consisting of~~ mercury, lead, nickel, zinc, copper, arsenic, cadmium and combinations thereof ~~from vaporous streams.--~~; and

--25. (Amended) The adsorption powder according to Claim 1, wherein the ~~powder is useful for removing~~ organic compounds are selected from the ~~group consisting of~~ furans and dioxins ~~from vaporous streams.--~~